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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/754,725	01/12/2004	Ching-Yu Chao	CHAO3025/EM	1342

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EXAMINER
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BEHSHAD, SHAHRAM

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 04/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/754,725

Applicant(s)

CHAO ET AL.

Examiner

Shah Behshad

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because in Figure 2c, reference characters "21" and "22" have both been used to designate the same region on the photoresist. Page 5 of the specifications teaches that the masking particles are used to selectively photo-polymerize region 22 which was not covered by the masking particles while region 21 covered by the masking particles is not photo-polymerized. In Figure 2c, sections 21 and 22 refer to the same regions in the photoresist polymer.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what is being etched in claim 1 step f because the photoresist layer has already been exposed and developed in claim 1 step d.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et. al. (patent no. 4664748) in view of Wells et. al. (US 6428943), and Stasiak et. al. (US 6962844).

In their patent, Ueno et. al. (patent no. 4664748) disclose an invention where they coat a glass substrate with a photoresist material having light-shielding particles mixed therein (see the abstract). A positive-working photoresist (1) is mixed with hyperfine particles of carbon black and the mixture is applied to a glass plate (3) to give a coat having a thickness of about 1 micron (Fig. 1a). As a result of subsequent exposure and development steps, only those parts of the resist which have been shielded from light by carbon black particles (2) remain in tact, as shown in Fig. 1b. Then the surface of the glass plate is etched with hydrofluoric acid producing a glass surface upon which glass columns are dispersed as shown in Fig. 1d. A plasma-

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assisted etching in a mixture of O<sub>2</sub> and CF<sub>4</sub> gases may be employed if the resist used has high plasma resistance. The principal object, therefore, of this invention is to provide a surface roughening method that is capable of providing an uneven surface for a substrate with high degree of controllability. Ueno et. al. claim that this object can be achieved by coating the surface of a substrate of interest with a photoresist, incorporating the light shielding micro particles, and after exposing and developing the photoresist, the substrate is etched with an etchant capable of etching the material of which the substrate is made. Ueno et. al. do not teach masking particles on top of the photoresist but Ueno et.al. does teach light-shielding particles mixed in with the photoresist.

Wells et. al. (US 6428943) discloses an invention whereby they introduce a method of microfabrication by providing a colloidal suspension containing a plurality of particles. The particles are suspended in a suspension medium which comprises deionized water, a resist such as a photoresist, and a solvent such as isopropyl alcohol (see column 2, lines 25-30). The particles are deposited on the surface of a substrate by evaporating off the solvent. The particles can be conveniently fabricated in sizes ranging from 0.5 to 5 microns (see column 4, lines 25 and 26). This reads on claim 7 of the application. The particles serve as a mask for etching or depositing the substrate. It would have been obvious to one of ordinary skill in the art to have used the suspension of particles sized 0.5 to 5 microns as used by Wells et. al. for masking in a process disclosed by Ueno et. al. because Wells et. al. teach a coating of colloidal suspension comprising a plurality of particles and a suspension medium can be used as

an exposure mask. Neither Ueno et. al nor Wells et. al. teach a passivation layer formed on the first photoresist layer as recited in claims 2, 8, 10, and 11. Stasiak et. al. (US 6962844) teach a passivation layer in column 5 lines 61-67 and column 6 lines 1-10. The passivation layer is coated over electrical conductors as well as portions of semiconducting polymer films between the electrical conductors. The passivation layer provides protection to the semiconducting polymer films and electrical conductors from damage and environmental degradation. The passivation layer may be formed from any of a wide range of polymeric materials, such as, polyimide, polyetherimides, polybutylene terephthalate, polyester, polyethylene naphthalate (PEN), or epoxy.

It would have been obvious to one of ordinary skill in the art to have used a passivation layer in the methods of Ueno et. al. and Wells et. al. because Stasiak et. al. teach that a passivation layer is used in the art to protect the underlying layer from damage.


Claims 9-12 recite repeating the process to form additional layers. It would have been obvious to one of ordinary skill in the art to have repeated the process steps to produce the desired number of layers.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shah Behshad whose telephone number is (571) 272-8948. The examiner can normally be reached on 8:30 - 17:00, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571)272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
KATHLEEN DUDA  
PRIMARY EXAMINER